WHAT IS CLAIMES IS:

1. A method of fabricating a semiconductor device, the method comprising the steps of:

(a) forming a silicon oxynitride film on a substrate;

(b) performing a heat treatment, while keeping a surface of the silicon oxynitride film in contact with a gas containing nitrogen, to introduce at least nitrogen into the silicon oxynitride film; and

(c) forming a semiconductor film containing an impurity on the silicon oxynitride film.

2. The method of claim 1, wherein the silicon oxynitride film is formed by using an N_2O gas in the step (a).

3. The method of claim 1, wherein the step (c) includes the substeps of:

forming, as the semiconductor film, an amorphous silicon film on the silicon oxynitride film;

implanting impurity ions into the amorphous silicon film; and

performing a heat treatment for activating the impurity to change the amorphous film into a polysilicon film.

4. The method of claim 1, wherein the heat treatment is performed at 800 to 1050 ℃ in the step (b).

5. The method of claim 1, wherein a gas containing nitrogen and oxygen is used as the gas containing nitrogen in the step (b).

6. The method of claim 5, wherein an NO gas is used as the

gas containing nitrogen in the step (b).

7. The method of claim 5, wherein an N_2O gas is used as the gas containing nitrogen in the step (b).

8. The method of any one of claims 1 to 7, wherein the semiconductor device is a p-channel MIS transistor and a silicon film for a gate electrode containing boron is formed in the step (c).